RESEARCH

Cariboo Forest Region

- Making Research Work For You -

EXTENSION NOTE #9
June 1993

Group Selection Systems for High Elevation Forests in the Cariboo Forest Region

RESEARCH ISSUE GROUPS

- **Soil Conservation**
- **Wildlife Habitat**
- **Hydrology**
- **Forest Health**
- **Reforestation**
- **Stand Tending**
- **Ecosystem Inventory and Classification**
- **Biodiversity**
- **Guideline Verification**
- **Extension**

INTRODUCTION

Mountain caribou spend much of the year in high elevation forests and feed almost exclusively on arboreal lichens during the winter, mainly *Alectoria sarmentosa* and *Bryoria* spp. Lichen dispersal, establishment and growth are slow, and an estimated one or two hundred years are required before a new clearcut will supply arboreal lichen comparable to old growth stands. Forest companies have prepared development plans identifying timber values in these areas, and alternative silvicultural systems which sustain lichen for caribou need to be explored.

Group selection was chosen as a practical silvicultural system to test under these circumstances, to examine the effectiveness of extracting timber while maintaining lichen growth and availability. The study is located at Blackbear and Grain Creeks in the Quesnel Highland of the Horsefly Forest District. The project is being conducted by the Forest Sciences Section of the BC Ministry of Forests, Cariboo Forest Region, with the cooperation of the Horsefly Forest District and Weldwood of Canada Ltd., Williams Lake Division. It has been primarily designed to develop a viable silvicultural system that will provide a basis for economical timber harvesting and also maintain suitable caribou habitat.

OBJECTIVES

The group selection system project's objectives specifically address the following:

- The viability of group selection on ESSF sites to maintain caribou habitat and old growth characteristics in managed forests,
- Blowdown risk and the

RESEARCH Section, Ministry of Forests, Cariboo Forest Region
200 – 640 Borland Street, Williams Lake, BC V2G 4T1 Phone (250)398-4345
Fax (250)398-4380 http://www.for.gov.bc.ca/cariboo/research/research.htm

incidence of forest health problems in group selection,

- The effectiveness of different natural and artificial regeneration treatments within a group selection system,
- The effects on soils, snow accumulation and melt, and wildlife diversity (especially small mammal and bird populations), and
- Providing Extension opportunities, in the form of a demonstration site, research reports, and high elevation management guidelines for operational foresters.

HARVESTING

Four blocks, averaging 40 ha each, were harvested in August 1992 and December 1992 / January 1993 using three treatments of different opening sizes: .03 ha, 0.13 ha and 1.0 ha. The target volume removal for each treatment was 30%, including skid trails but exclusive of roads and landings.

SILVICULTURE

The project is testing a total of 64 natural and artificial regeneration treatments for the three opening sizes. Natural regeneration treatments include natural and hand seeding of two species, Engelmann spruce and subalpine fir, on a scarified patch and an untreated section. Artificial regeneration treatments include planting lodgepole pine, Engelmann spruce and subalpine fir on five planting treatments in the summer of 1993 and 1994. The planting location treatments include untreated, a scarified patch and three microsite locations: naturally raised sites, rotten wood, and microsites protected from snow creep. These microsites are intended to improve the seedlings' environment by warming the soil and protecting from snow creep.

LICHEN MONITORING

Arboreal lichens are being carefully measured around each of the different opening sizes to compare growth and abundance with the undisturbed forest. For measuring growth rates, lichen is collected, transported to the regional lab, stabilized and weighed at a standard relative humidity, and placed in specially designed enclosures which are hung on tree branches. The process is repeated annually to measure growth.

Land Management Handbook Field Guide Insert #7 (refer to Extension Note #8) has been produced for operational use to estimate lichen abundance in stands. It will assist field staff in standardizing the description of lichen abundance which is necessary for deciding on suitable silvicultural systems in high elevation stands.

OTHER ASPECTS

The project's multi-disciplinary approach includes linking soil characteristics with seedling growth, estimating post-harvest site disturbance, and observing mycorrhizal presence in plots. Root form and foliar nutrient analysis will be conducted on seedlings slated for destructive sampling.

Snow hydrology studies will include snowcourse measurements, tipping bucket snow lysimeters in the harvested openings and undisturbed forest, and measures of snow creep.

Small mammals are being monitored for diversity and population density using Longworth live-capture traps. Bird species response is also being monitored using census points and spot mapping of territories.

The project has been designed to integrate as many aspects of forest biology and management as possible for practical application of the research results.

CONTACT

For more information, please contact **Michaela Waterhouse**, Silvicultural Systems, Research Associate, at 398-4405.
Michaela.Waterhouse@gems4.gov.bc.ca